1775A
1776A
Printers

Operator Manual

P/N 585554
August 1980

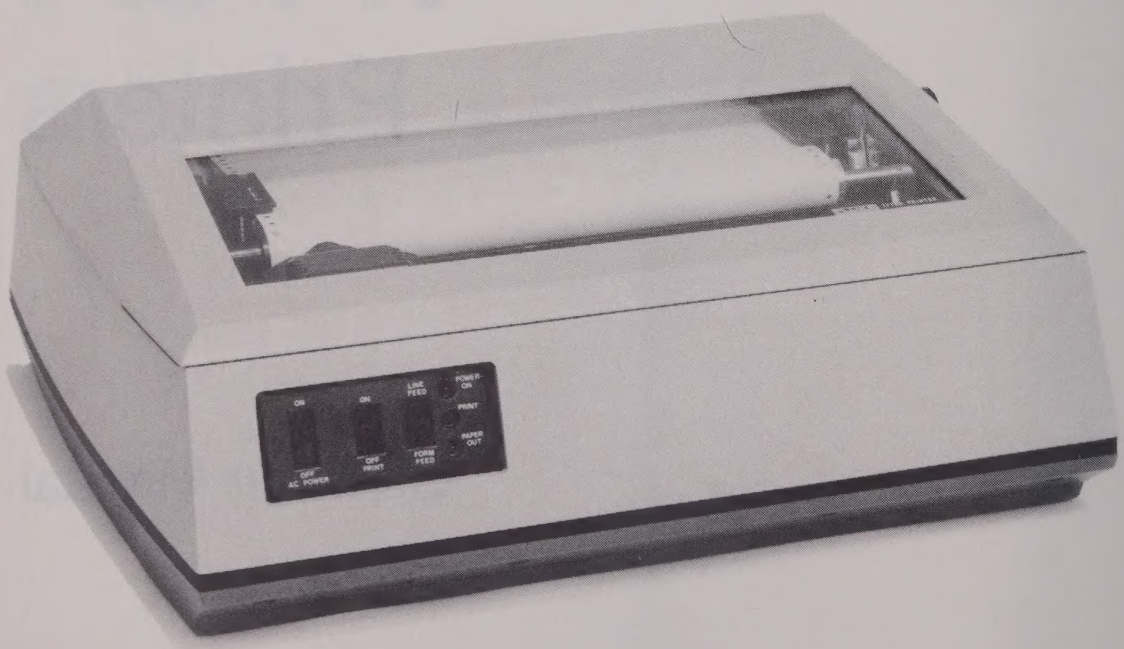
FLUKE®

1775A
1776A
Printers

Operator Manual

P/N 585554
August 1980

FLUKE®



Model 1775A/1776A Printers

Section 1
Introduction

THE INSTRUCTION MANUAL SET

The John Fluke Model 1775A and Model 1776A Printers are documented by a set of two manuals: The 1775A and 1776A Printer Operator Manual and the 1775A and 1776A Maintenance Manual. The 1775A and 1776A Operator Manual introduces the 1775A and 1776A and familiarizes the operator with all features, controls, and indicators, and presents detailed operating information and procedures. The 1775A and 1776A Maintenance Manual contains detailed overview and interface information.

The information in this manual is divided into four sections:

1. Introduction and Specifications
   Introduces the 1775A and 1776A Printers and the Instruction Manual Set and lists the printer accessories and specifications.

2. Installation
   Describes shipping and service information, installation procedures, and input power requirements.

3. Operating Features
   Describes the location and basic functions of all printer controls, and indicators, and mechanisms.

4. Operating Instructions
   Provides information on the various operations and procedures involved with using the 1775A and 1776A Printers.

DESCRIPTION

The John Fluke Model 1775A and Model 1776A Printers are desktop or pedestal serial printers designed for program development and production environment reporting. Both are capable of 160 characters per second bi-directionally. The print head prints a line in a given direction, moves to the nearest end of the next line to be printed, and prints that line in the opposite direction. This heightens overall printer efficiency. Up to 132 characters can be printed on one line.

Paper movement is controlled to and from the platen by two dual path tractors which adjust to accommodate varying paper widths. The printers use a line counter to control form feed commands for a 27.9 cm (11 inch) or other selected length. When the printer is out of paper, a sensor switch activates an audible alarm, a PAPER OUT indicator, and an interface FAULT signal. The printer will not function when out of paper.

An inked fabric ribbon is contained in a replaceable cartridge which easily snaps into place over two guide pins and the ribbon drive shaft. The useful ribbon life is approximately two million characters. The printer electronics are designed around a self contained microprocessor. Read/write memories store up to 132 printable characters supplied to the input before printing a line.

The difference between the two models is the interface used. Model 1775A comes equipped with the IEEE-488 bit-parallel interface. Model 1776A comes with the RS-232-C bit-serial interface. Further information on these interfaces is available in the Maintenance Manual.

Several accessories are available to support the operation and maintenance of the 1775A and 1776A printers. They are listed and described in Table 1-1.

SPECIFICATIONS

Table 1-2 lists the specifications for the 1775A and 1776A Printers.

Table 1-1. Accessories

MODEL	NAME	DESCRIPTION	MODEL	NAME	DESCRIPTION
Y1712	Printer Stand	A metal frame that provides a stable mounting at a conveniant desk height of 65 cm (25.6 inches).	Y1714	Ribbon Cartridge	Replaceable cartridge with two million character life.
Y1713	Paper Basket	Hooks into the printer case or to the Printer Stand. It accomodates up to 38 cm (15 inch) long printer paper.	Y1715	Paper	Paper supplied by Fluke is fan-fold white paper with perforated tractor holes on the long edges. When the perforations are broken, page size is 21.6 X 27.9 cm (8.5 X 11 inches).

Table 1-2. Specifications

PRINTING RATE ..... 160 characters per second

CHARACTER TRANSFER RATE

1775A ..... 75 kHz maximum

1776A ..... selected Buad rate

INPUT BUFFER SIZE

1775A ..... 132 characters

1776A ..... 736 characters

SINGLE LINE PAPER ADVANCE ..... 70 milliseconds maximum

MULTIPLE LINE PAPER ADVANCE ..... 20.3 cm (8 inches) per second

MAXIMUM NUMBER OF COLUMNS 132

LINE SPACING ..... 2.36 or 3.15 lines per cm (6 or 8 lines per inch)

CHARACTER SPACING ..... 3.94 or 1.97 (double width) characters per cm (10 or 5 characters per inch)

HORIZONTAL COLUMN DISPLACEMENT

Any Two Characters ..... ±.008 cm (.003 inch)

Between 10 Columns ..... ±.025 cm (.010 inch)

CHARACTER STYLE ..... 7 X 7 half space

CHARACTER SIZE

Width ..... .203 cm (.080 inch)

Height ..... .269 (.106 inch) high

CHARACTER SET ..... 96 character ASCII, upper & lower case

Table 1-2. Specifications (cont)

PAPER SIZE	Original and up to five copies of standard fan fold paper forms, 10.2 to 38.1 cm (4 to 15 inches) wide and 7.6 to 43 cm (3 to 17 inches) long.
ACCEPTABLE PAPER WEIGHTS	
Original Only	12 to 20 lb bond
Original & Up To Three Copies	11.5 to 20 lb bond
Original & Up to Five Copies	11.5 lb bond
Carbons	8 lb
SPROCKET HOLES	Diameter 4.06 mm (.160 inch), spacing 1.27 cm (.500 inch)
PAPER FEED	2 dual path tractors adjustable to fit varying paper widths
INKING SYSTEM	Continuous loop, non reversing, cartridge held, fabric ribbon with 2 million character life
POWER REQUIREMENTS	
Input Power	200 maximum
Line Voltage, Standard	90-132 VAC 59-61 Hz
(Specified at time of purchase)	90-110 VAC 49-51 Hz 187-264 VAC 49-51 Hz
Line Voltage, Optional Universal Power Supply	90-132 VAC 59-61 Hz
(Any one voltage can be selected using internal jumpers)	90-110 VAC 49-51 Hz 187-264 VAC 49-51 Hz
PHYSICAL DIMENSIONS (See Figure 1-1)	
Width	65 cm (25.5 inches)
Depth	50 cm (19.5 inches)
Height	
COVER CLOSED	21.6 cm (8.5 inches)
COVER OPEN	58.4 cm (23.0 inches)
WEIGHT	29 kg (64 lb)
STORAGE TEMPERATURE	-20°C to 60°C (-4°F to 140°F)
OPERATING TEMPERATURE	10°C to 38°C (50°F to 100.4°F)
HUMIDITY	10% to 90% relative humidity, non condensing
MAXIMUM ALTITUDE	15,000m (50,000 ft)

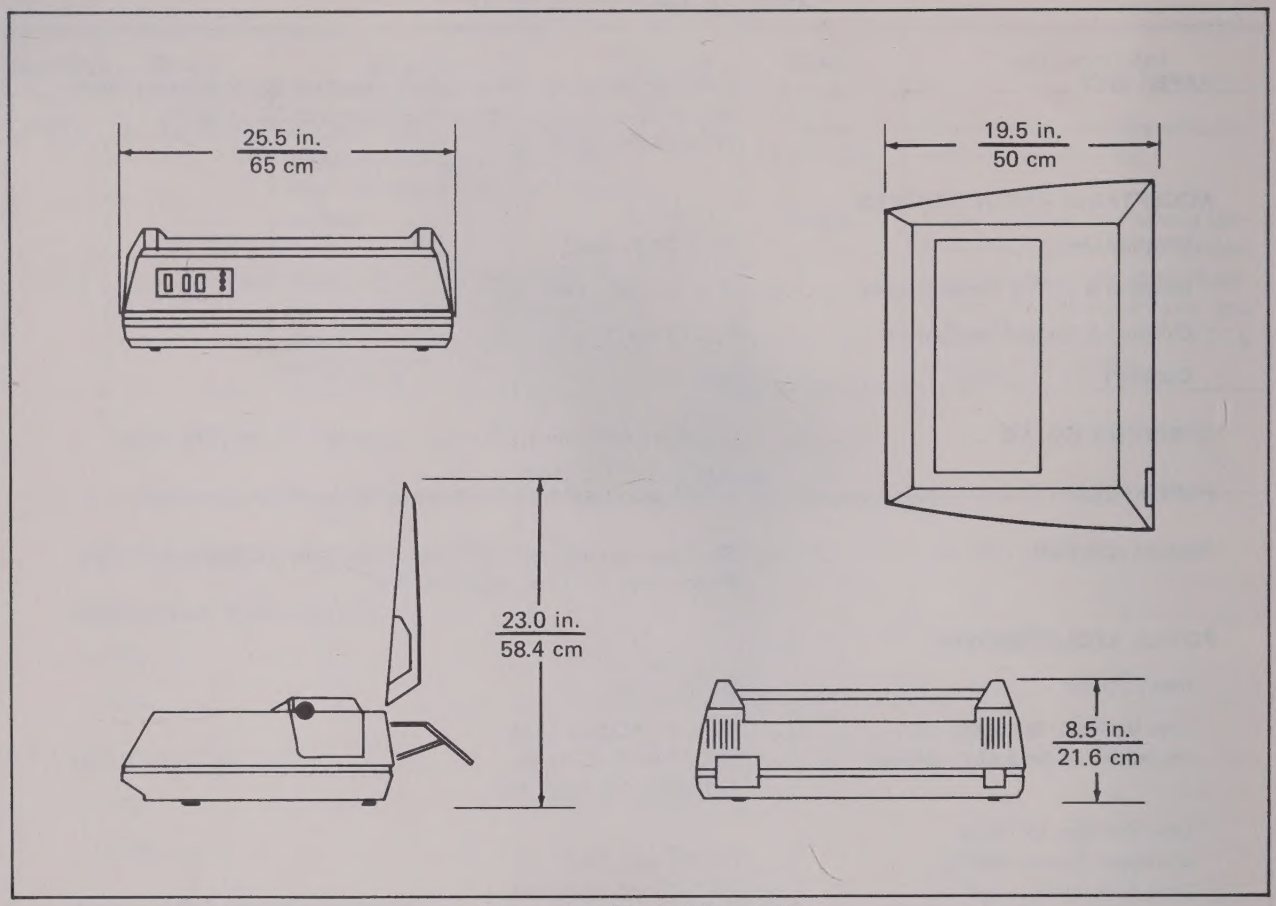


Figure 1-1. Physical Demensions

Section 2
Installation

INTRODUCTION

This section describes shipping and service information, the input power requirements, and installation procedures required to set up the printer.

SHIPPING AND SERVICE INFORMATION

Models 1775A and 1776A Printers are packaged and shipped in a foam-packed container. Upon receipt of the instrument, inspect it throughly for possible shipping damage. Special instructions for inspection and claims are included on the shipping container.

If reshipment is necessary, use the original container. If the original container is not available, contact a local Fluke sales office or order a new one from John Fluke Mfg. Co., Inc. P.O. Box 43210, Mountlake Terrace, WA 98043, telephone (206) 774-2211.

Each John Fluke Model 1775A or 1776A is warranted for a period of 90 days upon delivery to the original purchaser. The WARRANTY is located at the front of the Maintenance Manual.

For any additional information contact your nearest John Fluke Sales Representative or the John Fluke Mfg. Co., Inc. at the address or telephone number given above.

INPUT POWER REQUIREMENTS

The standard 1775A and 1776A may be ordered to operate from any of the following line voltages:

90-132 VAC 59-61 Hz
90-110 VAC 49-51 Hz
187-264 VAC 49-51 Hz

A rear panel label specifies the voltage selected prior to shipping. A change in voltage is only possible when the printer is equipped with the optional Universal Power Supply. Refer to the Maintenance Manual for information on how to change the voltage.

Installation Procedures

CAUTION

To avoid instrument damage the following procedures must be performed before applying power to the printer.

To install the printer and prepare it for operation, complete the following procedure:

1. Remove the printer from the shipping container.
2. Lift the cover and remove the packing around the print carriage.
3. Remove the tie wrap that secures the print head mechanism to the right side of the printer.
4. Close the cover and remove the shipping board from the bottom of the printer. Position the printer so the base pan is easily accessible.
5. Remove the two shipping screws shown in Figure 2-1. The printer will not operate properly with the shipping screws in place.
6. Check that the local line voltage and frequency to be applied agree with that specified on the label near the power cord receptacle. The location of the label is shown in Figure 2-2.
7. Connect line cord to the printer and to the local line AC power.

Prior to operating the printer it is necessary to install paper and a ribbon cartridge. Procedures are given for paper loading and ribbon changing in Section IV under Operating Notes.

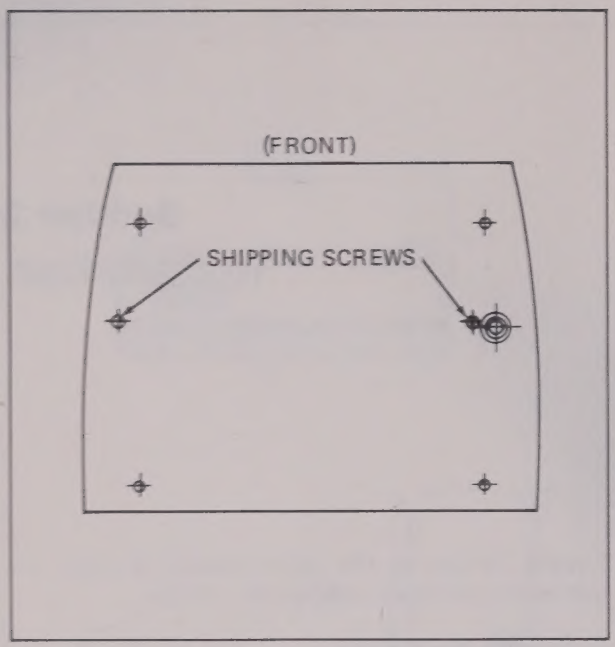


Figure 2-1. Location of Shipping Screws

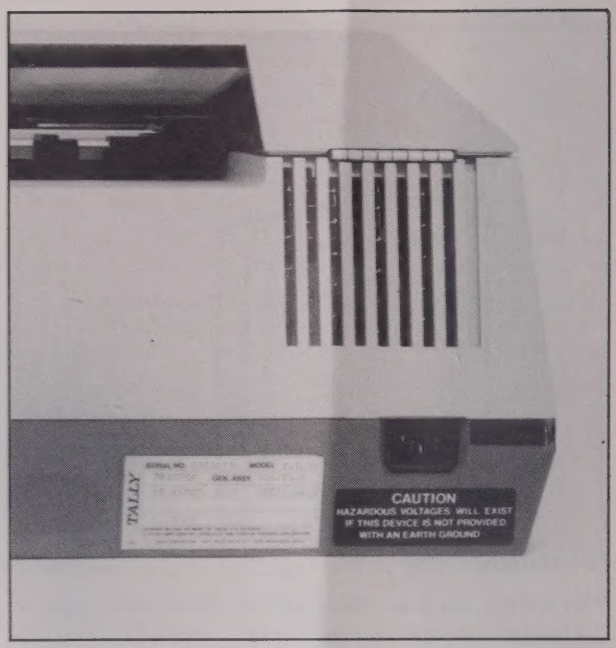


Figure 2-2. Voltage & Frequency Label

Section 3
Operating Features

INTRODUCTION

The material in the following paragraphs is designed to acquaint the operator with the Model 1775A and 1776A Printers. Each control, indicator, and mechanism is identified and described in the following paragraphs. It is recommended that the contents of the section be read and thoroughly understood before attempting to operate the printer.

CONTROLS, INDICATORS, AND MECHANISMS

The 1775A/1776A front panel controls and indicators are shown in Figure 3-1 and described in Table 3-1. Side panel selectors are shown in Figure 3-2 and described in Table 3-2. Figure 3-3 and Table 3-3 identify rear panel controls and Figure 3-4 and Table 3-4 identify operator functions located on the printer mechanism.

FUNCTION OF FEATURES

The following paragraphs contain additional information on the function of certain controls and indicators already introduced under Controls, Indicators, and Mechanisms.

AC POWER Switch

The AC POWER switch applies or removes AC power to the printer. When set in the ON position, the printer goes through an initialization cycle and, when completed, the POWER ON indicator lights. The switch also contains a circuit breaker to protect the unit under overload conditions. When the breaker trips, the AC POWER switch is set to the OFF position.

NOTE

On occasion the breaker may trip on initial turn on due to motor start-up surge. Power may be re-applied immediately.

PRINT ON/OFF Switch

When the Print ON/OFF switch is set to ON and the AC POWER switch is set to ON the printer is ready to print (on line). The PRINT indicator lights to indicate an on-line condition. At this time, the printer will respond to input and control data.

NOTE

The printer input buffer will accept data and control inputs until full regardless of the Print ON/OFF switch position.

FORM FEED/LINE FEED Control

This FORM/FEED/LINE FEED control is a momentary rocker switch. Monentarily setting the switch in the FORM FEED position causes paper to advance to the top of the next form. Momentarily setting the LINE FEED position causes the paper to advance one line. Holding the switch in either position causes paper to advance continuously. When the switch is released from the FORM FEED position paper motion stops at the top of the next form. When the switch is released from the LINE FEED position paper motion stops at the next line. The switch is inoperative when the PRINT switch is in the ON position.

NOTE

If the PRINT switch is in the OFF position and either Line Feed or Form Feed is activated, whatever remains in the printer buffer will be printed and a line feed completed.

Audible Alarm

An audible alarm sounds when the printer has only 7.6 cm (3″) of paper left in the paper supply. It also sounds when a bell code is received at the interface or a malfunction occurs causing the print head to make contact with either the left or right limit switches.

Forms Thickness Control

The Forms Thickness Control adjusts the distance between the platen and the print head to accomodate

accomodate various form thicknesses. In position 3, 4, or 5 the lever actuates a switch to increase current to the print needle drivers.

Paper Out Switch

The Paper Out Switch activates when less than 7.6 cm (3″) of paper is left in the printer. It causes an audible alarm, lights the Paper Out indicator, and sets the interface to not-ready.

Vertical Format Selectors

The Vertical Format Selectors are located on the right side of the printer near the paper advance knob. The 6/8 LPI Selector is part of a three position switch. It is used to select either six or eight lines of print per lineal inch (2.36 or 3.15 lines per cm). The third position is used for Self Test.

Two thumbwheel switches, are used in selecting vertical forms length. These are located just below the 6/8 LPI selector. The right thumbwheel has 10 positions showing a count from 0 to 9. The left thumbwheel shows the count in tens, from 0 to 15. A maximum setting would show 159, 15 on the left and 9 on the right. These switches are used for setting the number of lines of print that can be used in one form length. The setting 00 is interpreted as 66 for 6 LPI or 88 for 8 LPI.

Self Test Control

The far right switch position of the Vertical Format Selector is labeled SELF TEST. This is used to verify the operation of the internal electronics of the printer, aiding in isolation of system problems. The self-test runs continuously whenever selected, provided power is ON, PRINT is set to ON, and paper is in place.

LISTEN ALWAYS/WHEN ADDRESSED Switch (Model 1775A only)

In the LISTEN ALWAYS position, the printer will respond to all data that is on the bus. Command Mode on the bus has no effect.

In the WHEN ADDRESSED position, the printer will respond to data only when addressed. Command Mode on the bus is used to address and unaddress the printer.

Address Selection (Model 1775A only)

The Address Selection switch is located inside the printer on the IEEE-488 Interface. The printer is factory set to address 00. To set a different address for printer response, access to the IEEE-488 Interface is required. Refer to the Maintenance Manual for details.

Parity Switch (Model 1776A only)

Parity is a scheme of error detection that uses one extra bit for each character such that the number of one-bits in each character is either even or odd. This switch should be set to EVEN or ODD when the source of incoming data generates parity. In the OFF position, a parity bit must be present but its setting is not checked.

Baud Rate Switch (Model 1776A only)

Baud rate is the transfer rate of bit-serial characters in bits per second. This switch should be set to match the baud rate that will be used to send characters to the printer. The numbers on the switch should be multiplied by 100 to get the actual baud rate (e.g.: 12 = 1200 baud).

Setting of 24, 48, and 96 allow characters to be sent to the printer at a faster rate than it is capable of printing. As long as the source of incoming data is capable of holding off when the printer indicates its character buffer is full, these settings will optimize printing throughput.

GND (Ground) Connection

The printer is safety grounded through its power cable, and the signal cable contains its own return ground reference. This supplementary ground connection is provided for use when a dry environment contributes to paper handling problems, and to further reduce electrical noise on the data cable.

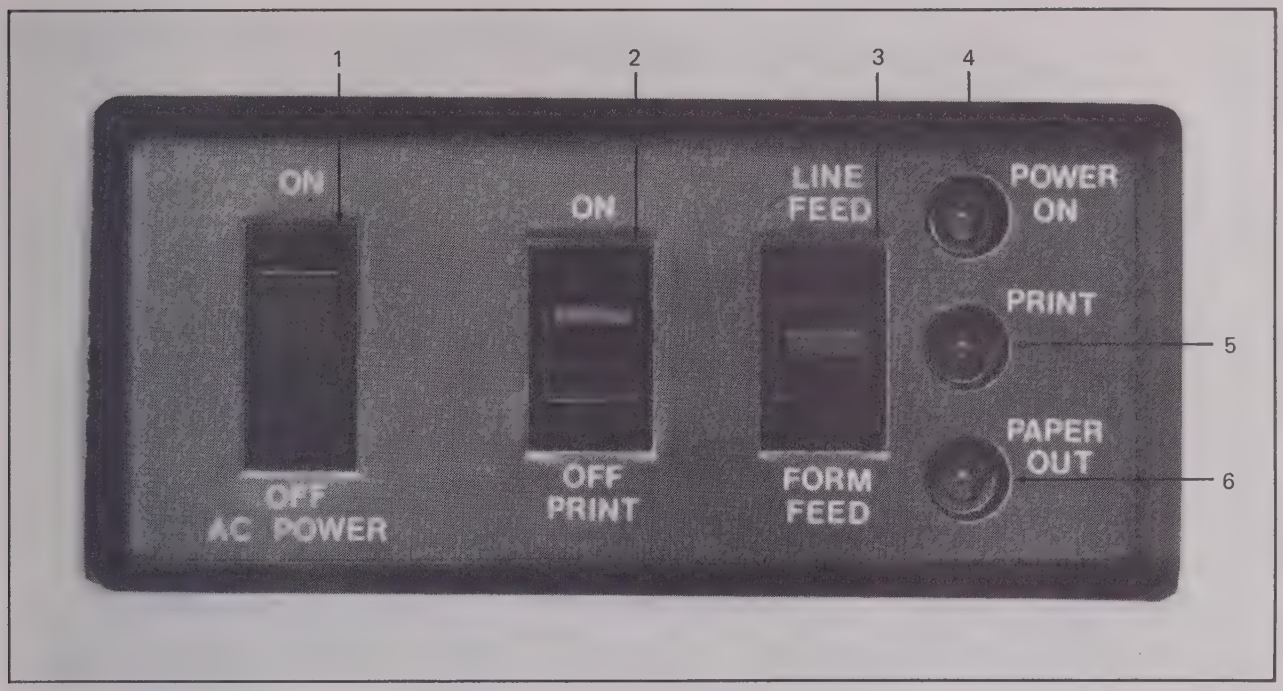


Figure 3-1. Front Panel Controls & Indicators

Table 3-1. Front Panel Controls & Indicators

REFERENCE NUMBER	NAME	FUNCTION
1	POWER ON/OFF	Applies or removes AC Switch power to the printer
2	PRINT ON/OFF Switch	Used to switch the printer on-line or off-line
3	FORM FEED/LINE FEED	Causes the printer to advance to switch the top of the next form or next line
4	POWER ON Indicator	Indicates when lit that AC power is being applied
5	PRINT Indicator	Indicates when lit that AC power is being applied and the printer is on line
6	PAPER OUT Indicator	When lit, indicates that less than 7.6 cm (3") of paper is left in the printer
-	Audible Alarm	Sounds when less than 7.6 cm (3") of paper is left in the printer

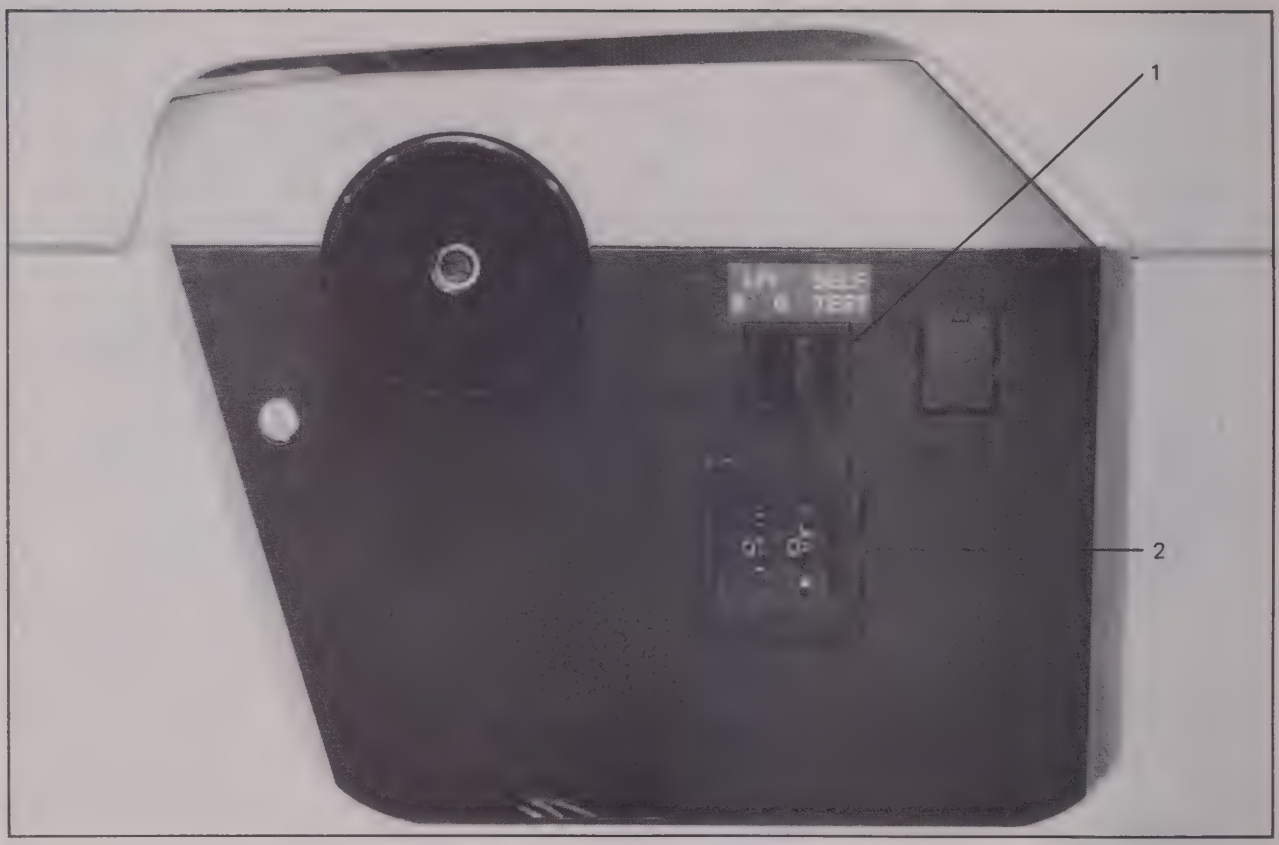


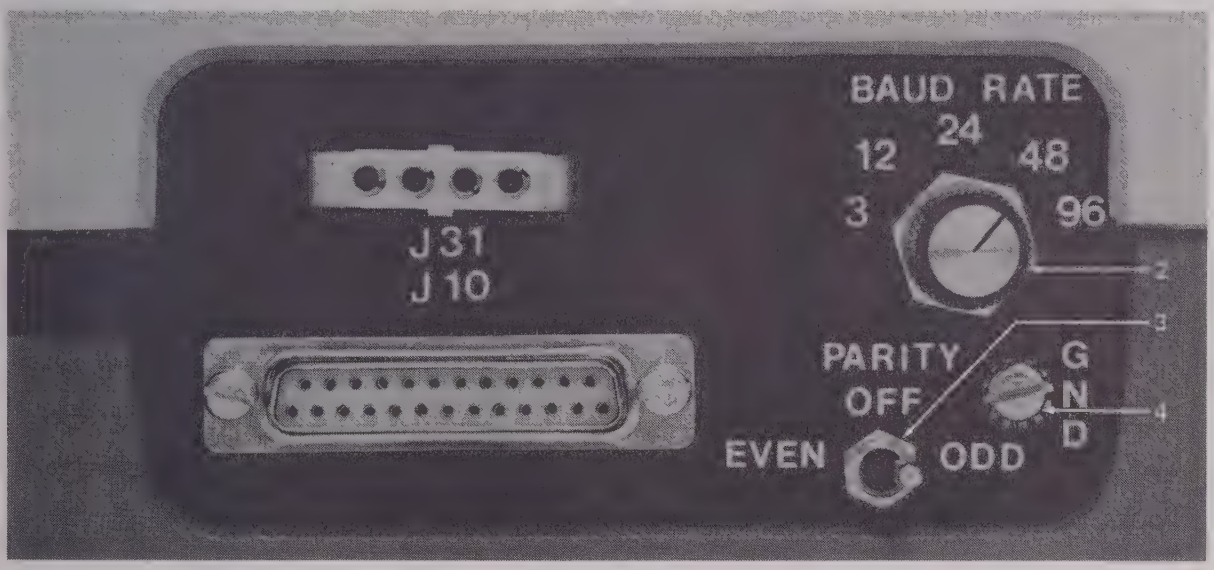
Figure 3-2. Side Panel Selectors

Table 3-2. Side Panel Selectors

REFERENCE NUMBER	NAME	DESCRIPTION
1	6/8 LPI and SELF-TEST Selector	Provides selection of either 6 or 8 lines per lineal inch of print (2.36 or 3.15 lines per cm.) Initiates the test pattern to verify the operation of the internal electronics
2	Forms Length Selector	Allows selection of the number of lines to be printed per form

MODEL 1775A NOT YET RELEASED.

(MODEL 1775A)

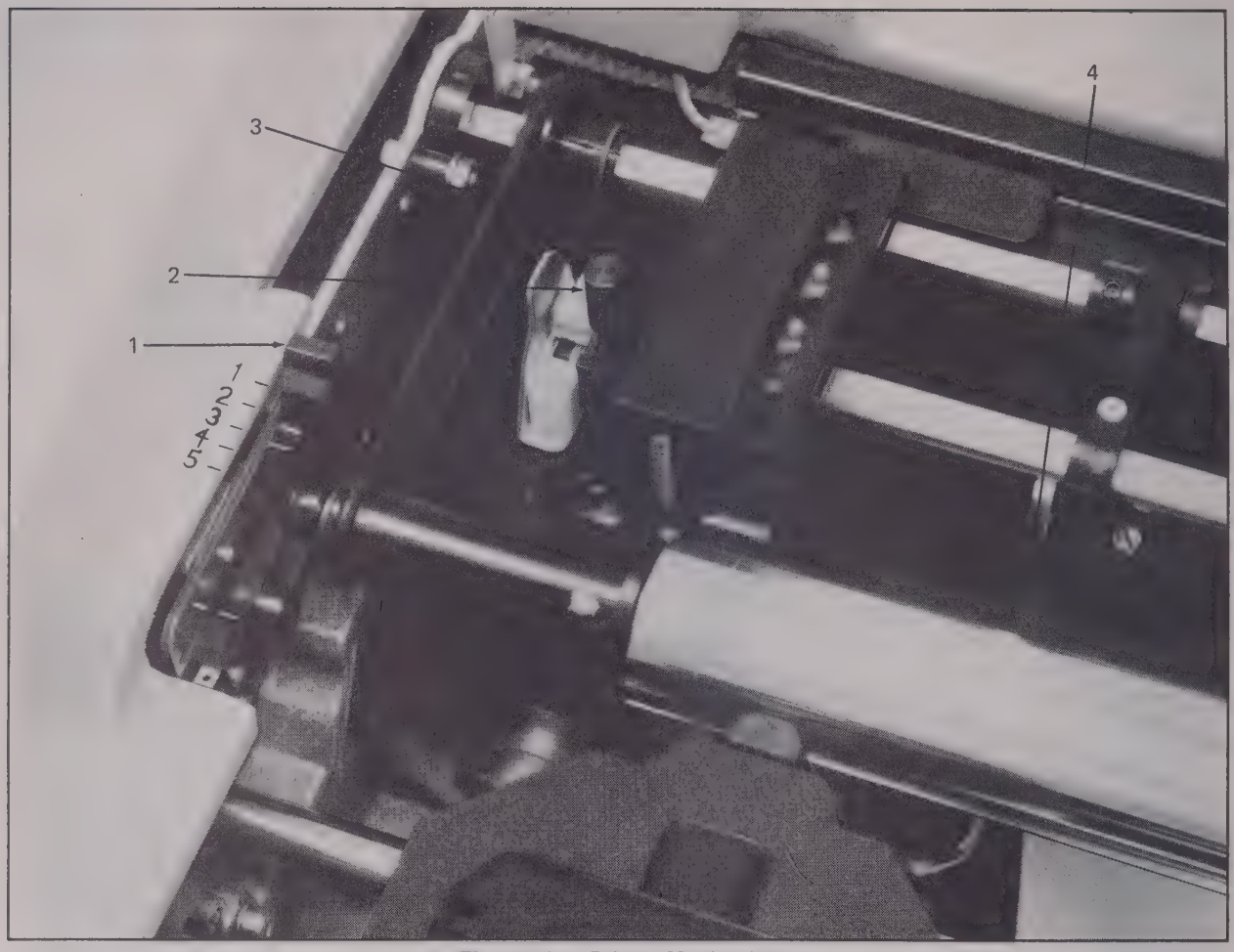


(MODEL 1776A)

Figure 3-3. Rear Panel Controls

Table 3-3. Rear Panel Controls

REFERENCE NUMBER	NAME	FUNCTION
		Model 1775A Only
1	LISTEN ALWAYS/WHEN ADDRESSED Switch	Allows selection of when printer should respond to data
		Model 1776A Only
2	BAUD RATE Switch	Allows setting of the baud rate to match that of incoming data
3	Parity Switch	Allows setting of the parity to match source of incoming data
4	Ground (GND) Terminal	Auxiliary ground



Figures 3-4. Printer Mechanisms

Table 3-4. Printer Mechanisms

REFERENCE NUMBER	NAME	FUNCTION
1	Forms Thickness Control	Provides adjustment for number of copies in the platen
2	Tractor Locking Knobs	Allow tractors to be adjusted for varying widths
3	Paper Clamps	Secure paper in tractors
4	Paper Out Switch	Activates when less than 7.6 cm (3") of paper is left in the printer

Section 4
Operating Instructions

INTRODUCTION

The following section provides installation and operating information for the Model 1775A and 1776A printers. Both local and remote operations are described.

OPERATING NOTES

The following paragraphs describe support procedures necessary for operating the 1775A and 1776A.

Paper Loading

Use the following procedure to load paper into the printer:

1. Set Print ON/OFF Switch to OFF.

2. Lift the top cover.

3. Set the Forms Thickness Control to position 5.

4. Place the paper up onto the tractors. If the form width does not match, loosen the tractor locking knobs (see Figure 3-4) and position the tractors so the sprockets match the paper holes. When positioned, tighten the locking knobs.

NOTE

Paper must be kept flush with the left to prevent the print head from printing on the platen.

5. Lift the tractor mechanism to the load position as shown in Figure 4-1.

6. Open both of the bottom paper clamps.

7. Place the paper behind the printer and pull the leading edge under the tractor mechanism, printing side down.

8. Place the paper sprocket holes onto the bottom tractors, close the paper clamps, and return the tractor mechanism to the operating position, as shown in Figure 4-2.

9. For full-width paper, remove the ribbon cartridge to allow room between the platen and the print head. With narrower paper, moving the print head mechanism to the right may be sufficient.

10. Using the paper advance knob, advance the paper while guiding it under and around the platen and up past the print head.

11. Open both of the upper paper clamps and place the paper onto the upper tractors.

12. Set the PRINT ON/OFF switch to ON, then to OFF.

13. Momentarily press FORM FEED. This sets the line counter.

14. Manually advance the paper to the top of the next form, leaving space to fit the desired format. (Characters will be printed about 1 cm below the edge of the print head)

15. Close the top cover.

Ribbon Changing

The ribbon cartridge may be changed without removing paper from the printer. Each ribbon cartridge is sufficient for printing 2 million characters. To change the cartridge, proceed as follows:

1. Set the PRINT ON/OFF switch to OFF.

2. Lift the top cover.

3. Set the Forms Thickness Control to position 5.

4. Remove the old ribbon cartridge by spreading the red guide pins apart and lifting the cartridge straight up. Dispose of the old cartridge.

5. Remove the wire from the right side of the new cartridge (see Figure 4-3).

6. Turn the ribbon advance knob clockwise with the ribbon advance knob to remove any slack.

7. Tip the front of the cartridge down and slip the ribbon between the print head and the platen or paper.

8. Pull the cartridge back to allow it to clear the print head assembly and snap the cartridge into place between the red guide pins.

9. Manually advance the ribbon to remove any slack by turning the ribbon advance knob clockwise. Check to make sure it tracks properly through the slot in the print head.

10. Close the top cover.

Self Test Procedure

The Self Test Verifies the operation of the internal electronics of the printer and the printer mechanism. In case of a system malfunction, it serves as an aid in isolating problems. Figure 4-4 shows the SELF TEST switch. The procedure for Self Test operation is as follows:

1. Load the printer with 132 column paper.
2. Set the AC POWER switch to ON.
3. Set the SELF-TEST Switch to SELF-TEST.
4. Set the PRINT switch to ON.

At this point, the printer will begin to continuously print 66 line test patterns until the PRINT switch is set to off. When the self test is completed:

1. Set the PRINT switch to OFF.

2. Set the SELF TEST switch back to either 6 or 8 lines per inch.

NOTE

A bottom of form skip will interrupt the pattern if the vertical format length switches are set to 00.

If the test pattern is not identical to the sample shown in Figure 4-5, call the nearest Fluke Technical Service Center. Locations are listed in the Maintenance Manual.

Setting Vertical Format Controls

The Vertical Format Controls allow the operator to select the desired density of lines per inch and the number of lines per form. Figure 4-4 shows the Vertical Format Controls.

For a 27.9 cm (11 inch) form, set the Forms Length selector to 00. The 6/8 LPI Selector should be set to either six or eight lines per inch, as desired. The printer will print as selected, either 60 or 80 lines per form with a 2.5 cm (1 inch) bottom of form skip.

For other form lengths calculate the total number of lines necessary. To do this, multiply the form length in inches, by the number of lines per inch being printed. Set the forms Length Control to the number of lines necessary and the 6/8 LPI Selector to either 6 or 8.

NOTE

There is no bottom of form skip with the Forms Length Selector set at anything other than 00.

Remote Operations

The following paragraphs describe the printer functions that can be done remotely and the RS-232 pin assignments. (See Table 4-1).

ASCII CHARACTER SET

Figure 4-6 shows the 1775A and 1776A character set and the control functions that are responded to by the printer.

REMOTE CONTROL CODES

The printer functions summarized in Table 4-2 can be done remotely. Any additional control codes not listed in the Table are ignored by the printer.

OPERATION

Once the printer is properly set up for operation, operator attention is not constantly required. Use the following checklist to ensure proper setup. Refer to the procedures given in previous paragraphs when necessary:

1. Load paper.

2. Install ribbon cartridge.

3. Set LISTEN ALWAYS/WHEN ADDRESSED switch as required (Model 1775A only).

4. Set Baud Rate Control to match incoming data rate (Model 1776A only).

5. Set parity switch to match source of incoming data (Model 1776A only).

6. Set Vertical Format Controls as desired.

7. Set Forms Thickness Control for the number of copies being printed.

8. Check that the interface cable is connected.

9. Set AC POWER switch to ON.

10. Set PRINT switch to ON. The printer is now ready to receive and print data.

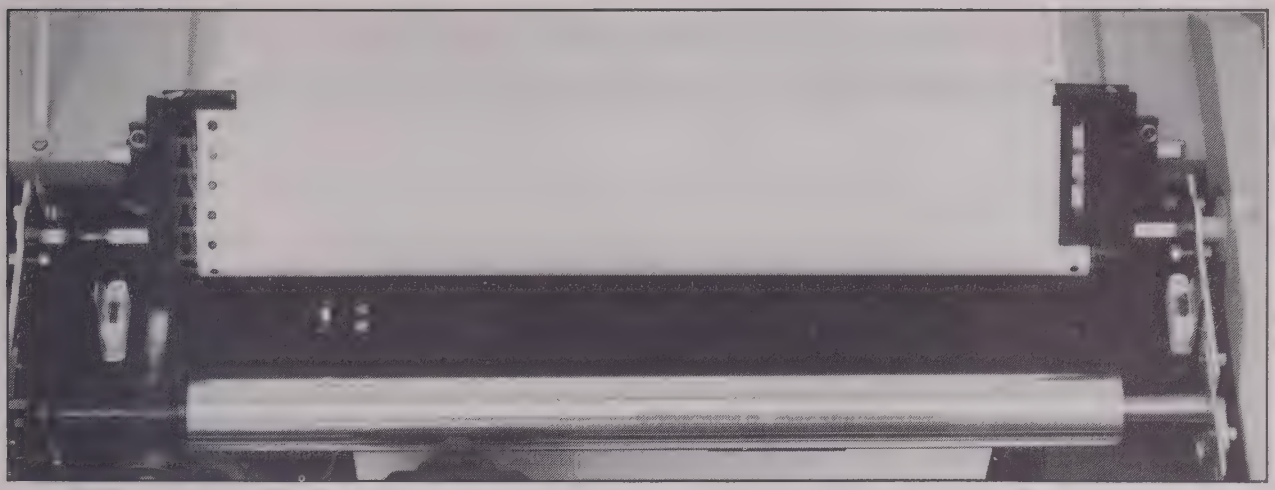


Figure 4-1. Tractor Load Position

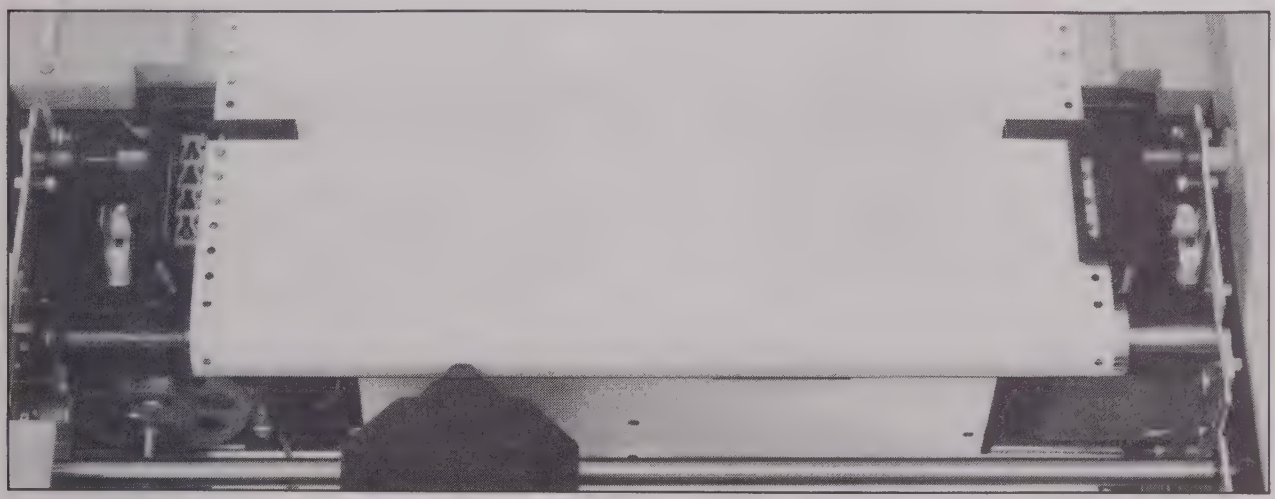


Figure 4-2. Printer With Paper Loaded, Left Clamp Open

Figure 4-3. Ribbon Cartridge

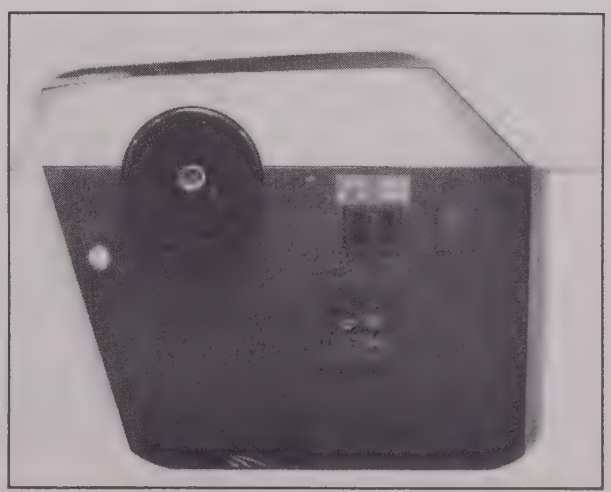


Figure 4-4. Side Panel Selectors

Figure 4-5. Self Test Pattern

			7	0	0	0	0	1	1	1	1
			6	0	0	1	1	0	0	1	1
			5	0	1	0	1	0	1	0	1
4	3	2	1	CONTROL CODES		PRINT CHARACTERS					
0	0	0	0				0	@	P	`	p
0	0	0	1			!	1	A	Q	a	q
0	0	1	0			"	2	B	R	b	r
0	0	1	1			#	3	C	S	c	s
0	1	0	0			$	4	D	T	d	t
0	1	0	1			%	5	E	U	e	u
0	1	1	0			&	6	F	V	f	v
0	1	1	1	BEL		'	7	G	W	g	w
1	0	0	0			(	8	H	X	h	x
1	0	0	1			)	9	I	Y	i	y
1	0	1	0	LF		*	:	J	Z	j	z
1	0	1	1	VT	ESC	+	;	K	[	k	{
1	1	0	0	FF		,	<	L	\	l	|
1	1	0	1	CR		-	=	M	]	m	}
1	1	1	0			.	>	N	^	n	~
1	1	1	1			/	?	O	_	o	DEL

Figure 4-6. ASCII Character Set

Table 4-1. RS-232 Connector Pin Assignments

PIN	NAME	IN/OUT	FUNCTION
1	GND	–	Protective Ground
2	XMT	OUT	Transmitted Data. Sends Control-Q (X-ON) code at Power-ON.
3	REC	IN	Received Data
5	CTS	IN	Not-used input, pulled through 10 kilohms to +12V.
6	DSR	IN	Not-used input, connected to logic but not checked.
7	RET	–	Signal Return
11	Note 1	OUT	Busy (Low-True). Indicates the 736 character data buffer is within one line (132 characters) of becoming full.
17	RCLK	IN	Not-used input, connected to logic but not checked.
19	SRTS	OUT	Busy (Low-True). Same as Pin 11.
20	DTR	OUT	Ready. True except when out of paper, an internal fault is detected, or the PRINT switch is off.
24	XCLK	OUT	Clock pulse. Frequency is 16 times the selected baud rate.

Note 1: Not assigned by EIA Standard RS-232-C.

Table 4-2. Remote Control Codes

FUNCTION	SYMBOL	DECIMAL CODE	OUTPUT
Carriage Return	CR	13	Initiates a print cycle as long as one printable character is present in the printer buffer. If there is nothing present, the carriage return is ignored.
Line Feed	LF	10	Causes the printer to advance one line. When occurring in succession, the slew rate is 8.5 inches per second.
Form Feed	FF	15	Causes the printer to advance to the top of the next form.
Vertical Tab	VT	11	Produces a one line paper advance. Same as Line Feed.
Delete	DEL	1.27	Causes the contents of the printer buffer to be erased.
Bell	BEL	07	Causes the audible alarm sound for 2 seconds for each bell code received.
Double Width	SO	14	When received during any printable line, causes the whole line to be printed in double width characters.
	ESC SO ESC SI	14 27 15 27	Any character received between ESC SO & ESC SI is printed as a double width character. The maximum number of double width groups per line is five.
	ESC SO	14 27	Any character immediately following ESC SO is printed double width. The maximum number per line is five.

585554